

U.S. Department of Energy
Washington, D.C.

ORDER

DOE O 426.2B

Approved: 08-05-2026

**SUBJECT: PERSONNEL SELECTION, TRAINING, QUALIFICATION, AND
CERTIFICATION REQUIREMENTS FOR DOE NUCLEAR FACILITIES**

1. PURPOSE.

- a. This Order establishes personnel selection, training, qualification, and certification requirements for all contractor personnel conducting activities (including providing items and services) that affect, or may affect, the safety of Department of Energy (DOE) nuclear facilities.
- b. Implementation of all requirements in this Order constitutes an acceptable method of complying with Title 10 Code of Federal Regulations (CFR) § 830.122, Quality assurance criteria, Criterion 2—Management/Personnel Training and Qualification, for the performance of work activities described in this Order.

2. CANCELS/SUPERSEDES. DOE Order (O) 426.2A, Chg. 1 (AdminChg), *Personnel Selection, Training, Qualification, and Certification Requirements for DOE Nuclear Facilities*, dated May 30, 2024. Cancellation of a directive does not, by itself, modify or otherwise affect any contractual or regulatory obligation to comply with the directive. Contractor Requirements Documents (CRDs) that have been incorporated into a contract remain in effect throughout the term of the contract unless and until the contract or regulatory commitment is modified to either eliminate requirements that are no longer applicable or substitute a new set of requirements.

3. APPLICABILITY.

- a. Departmental Applicability. This Order applies to all departmental elements, including the National Nuclear Security Administration (NNSA), responsible for the operation of Hazard Category 1, 2, and 3 reactors and nonreactor DOE nuclear facilities. The NNSA Administrator will assure that NNSA employees and contractors comply with the responsibilities under this directive. Nothing in this Order will be construed to interfere with the NNSA Administrator's authority under Section 3212(d) of Public Law 106-65, National Defense Authorization Act for Fiscal Year 2000, to establish Administration-specific policies, unless disapproved by the Secretary.
- b. DOE Contractors. The requirements of this Order shall be incorporated into applicable contracts, including Management and Operating contracts. The contractor is responsible for flowing down the requirements of this CRD, if applicable. Contractors shall comply with the requirements of applicable federal, state, and local laws and regulations in carrying out the requirements of this Order unless relief has been granted in writing. Omission of any applicable law or

regulation from the Order does not affect the obligation of the contractor to comply with such law or regulation. Contractors must comply with the requirements of this Order, except to the extent modified by the equivalencies or exemptions identified herein or issued to the contractor in writing by DOE utilizing the process outlined in DOE Order (O) 251.1E, *Departmental Directives Program*, including as amended or updated. Equivalencies or exemptions for DOE O 426.2B, *Personnel Selection, Training, Qualification, and Certification Requirements for DOE Nuclear Facilities*. Equivalencies and exemptions to this Order are processed in accordance with DOE O 251.1E, current version. Central Technical Authority concurrence is required for both exemptions and equivalencies to this Order. EXEMPTION. This Order does not apply to activities that exclusively involve transportation or offering transportation of hazardous materials (including radioactive materials), substances, and wastes.

5. EQUIVALENCY. In accordance with the responsibilities and authorities assigned by Executive Order 12344, Naval Nuclear Propulsion Program, codified at 50 United States Code (U.S.C.) §§ 2406, Deputy Administrator for Naval Reactors, and 2511, and to ensure consistency through the joint Navy/DOE Naval Nuclear Propulsion Program, the Deputy Administrator for Naval Reactors will implement and oversee requirements and practices pertaining to this Directive for activities under the Deputy Administrator's authority, as deemed appropriate.

6. REQUIREMENTS.

- a. A selection, training, qualification, and certification program (hereafter "training and qualification program"), as described in this Order, must be implemented at Hazard Category 1, 2, and 3 reactor or nonreactor nuclear facilities.
- b. Regardless of the performer of the work, the contractor is responsible for complying with the requirements of this CRD consistent with applicable federal laws. The contractor is responsible for flowing down the requirements of this CRD to subcontractors at any tier to the extent necessary to ensure the contractor's compliance with the requirements.
- c. The following DOE regulations and directives provide requirements and procedures on how training records and information are to be handled and protected:

- (1) 10 CFR § 1008, Records Maintained on Individuals (Privacy Act).

7. RESPONSIBILITIES.

- a. Contracting Officer. For all applicable contracts and upon notification that a site/facility management contract is affected by this Order, the Contracting Officer(s) shall incorporate the requirements into the affected contract(s) via the "Laws, Regulations, and DOE Directives" clause of the contract, or through negotiation and modification, as appropriate.

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8. REFERENCES. See Attachment 2. INVOKED STANDARDS. This Order does not invoke any DOE technical standards or industry standards as required methods. Any technical standard or industry standard that is mentioned in or referenced by this Order is not invoked by this Order. Note: DOE O 251.1D, Appendix J, provides a definition for “invoked technical standard.”
10. DEFINITIONS. See Attachment 3.
11. CONTACT. Questions concerning this Order may be addressed to the Office of Quality Assurance and Nuclear Safety Management Programs at nuclearsafety@hq.doe.gov. Nuclear Threat Science, (202) 586-4582.

BY ORDER OF THE SECRETARY OF ENERGY:



JAMES P. DANLY
Deputy Secretary

ATTACHMENT 1, CHAPTER I
GENERAL TRAINING REQUIREMENTS, HAZARD CATEGORY 1, 2, AND 3
NONREACTOR AND REACTOR NUCLEAR FACILITIES

1. PURPOSE. The contractor must establish, implement, and maintain a training and qualification program that provides reasonable assurance that personnel whose activities impact the facility safety basis are selected, trained, qualified, certified (when required), remediated, maintained proficient, and requalified/recertified in accordance with the provisions of this chapter.
2. SCOPE. This chapter covers reactor and nonreactor nuclear facility requirements. The contractor training and qualification program must be developed and maintained using a systematic approach to training (SAT) and implemented using a graded approach commensurate with facility hazards and activity risk.
2. APPLICABILITY. Activities exclusively involving transportation/offering transportation of hazardous materials (including radioactive materials), substances, and wastes are excluded from the requirements of this Order.
3. EXCLUSIONS. Activities exclusively involving transportation/offering transportation of hazardous materials (including radioactive materials), substances, and wastes are excluded from the requirements of this Order.
4. TRAINING ORGANIZATION.
 - a. The contractor must establish one or more training organizations responsible for training personnel subject to this Order.
 - b. The training organization(s) may support the line organization in identifying, meeting, and monitoring training needs and assisting with the implementation of an SAT.
 - c. Line management retains accountability for safe operations.
 - d. For positions requiring certification, the contractor must require management endorsement outside the candidate's immediate supervisor.
5. CONTRACTOR ASSURANCE. The contractor must perform periodic assessments of nuclear training programs to ensure continued effectiveness and compliance with applicable requirements.
6. TRAINING PROGRAM DOCUMENTATION.
 - a. The contractor must develop and maintain a training program that identifies how applicable requirements are implemented.
 - b. Contractors will apply DOE reciprocity and exception standards to credit previous training completed.

- c. For sites with one or more facilities, the contractor may use a combined program provided the document(s) meets all applicable requirements.
 - d. The contractor may implement oversight activities that verify program adequacy, implementation, and continuing alignment with facility hazards and the safety basis.
- 7. SYSTEMATIC APPROACH. The contractor must establish a systematic approach for personnel selection, training, qualification, and certification for identified positions whose activities impact the safety basis of a nuclear facility.
- 8. GRADED APPROACH.
 - a. The contractor must apply a graded approach ensuring appropriate training and qualification program detail and rigor are commensurate with facility hazards and activity risk.
 - b. The contractor must document when a risk-informed decision is applied.
- 9. CHANGE CONTROL.
 - a. The contractor must evaluate changes to facilities, processes, documented safety analyses (DSAs), technical safety requirements (TSRs), justifications for continued operations, procedures, and applicable regulatory requirements to determine impacts on training and qualification programs.
 - b. The contractor must update affected training and qualification program requirements, as required.
- 10. PERSONNEL SELECTION.
 - a. The contractor must establish position-specific selection standards (education, experience, and medical examination requirements as applicable) consistent with job expectations, technical complexity, and knowledge level required for safe performance.
 - b. Alternative criteria may be defined and implemented for personnel selection requirements. Relevant experience, or a combination of experience and education, may be used in lieu of degree requirements on a case-by-case basis.
 - c. Consistent application of personnel selection criteria must be documented and applied to all personnel in defined positions, including subcontractors.
- 11. UNESCORTED FACILITY ACCESS TRAINING (UFAT).
 - a. All personnel requiring unescorted access must be trained and evaluated on the topics listed below, as applicable to the facility:
 - (1) Facility description.

- (2) Access-related policies (including escort duties), procedures, and instructions.
- (3) Radiological hazards.
- (4) Facility emergency response actions.
- (5) Industrial hazards.
- (6) Fire response protocol/fire protection program elements.
- (7) Security requirements.
- (8) Facility walkthroughs, as conditions allow.

12. QUALIFICATION/CERTIFICATION PROGRAMS.

- a. The contractor must establish procedures governing qualification/certification processes and document the knowledge, skills, and abilities for defined positions and required activities.
- b. The contractor must maintain current and accurate qualification/certification records.
- c. Unqualified/uncertified personnel or personnel in training must be under the direct supervision of a qualified individual.
- d. Qualifications/certifications may be revoked for cause such as medical disqualification or performance deficiencies.
- e. The contractor may establish a provisional qualification process to define and document progression towards meeting full qualification/certification. This status allows limited operations.

13. CERTIFICATION.

- a. Certification endorsements must be documented and completed after qualification and any additional required elements (e.g., evaluations, medical examination if applicable).
- b. Personnel handling significant quantities of fissionable material must be certified. Personnel handling less than significant quantities of fissionable materials need not be certified. Any additional positions requiring certification must be identified based on the graded approach.
- c. Evaluations for certification must meet all requirements for qualification plus an oral exam.

14. MEDICAL EXAMINATION.

- a. Qualified personnel may be required to complete a medical examination, as applicable to the position.
- b. Certified personnel must complete a medical examination to verify fitness for duty and receive periodic medical reexamination at an interval not to exceed 5 years based on job responsibilities, facility hazards, and applicable requirements.
- c. Medical clearance may be required before return to duties following illness/injury or other debilitating factor.

15. EVALUATIONS.

- a. Evaluations must sample knowledge and performance derived from approved learning objectives.
- b. Oral evaluations must demonstrate job-specific actions and may be conducted as a one-on-one walkthrough (potentially during the operational evaluation) or by an oral board empaneled by facility managers and knowledgeable and/or qualified personnel.
- c. Simulation-based operational evaluations may be used to support qualifications for emergency response actions or when facility conditions do not permit actual operation of processes or components.
- d. Certified positions must include:
 - (1) A comprehensive evaluation containing representative questions derived from approved learning objectives.
 - (2) An oral evaluation (one-on-one or oral board) tailored to evaluate operational knowledge and organizational awareness under normal and abnormal conditions.

16. TRAINING EXCEPTIONS.

- a. The contractor must establish a procedure for granting and documenting individual exceptions to training and qualification program requirements.

17. CONTINUING TRAINING.

- a. The contractor must establish continuing training programs using a graded approach commensurate with facility hazards and activity risk.
- b. Continuing training cycles may not exceed 5 years.

18. OPERATIONAL DRILLS.

- a. The contractor must conduct periodic operational drills sufficient to demonstrate response to abnormal and accident conditions.
- b. Operational drills must be commensurate with facility hazards, complexity, and credible accident scenarios.
- c. Operational drills must be documented in the training and qualification program.
- d. Operational drills may be conducted in conjunction with emergency management drills required by DOE O 151.1E, *Comprehensive Emergency Management System*.

19. REQUALIFICATION/RECERTIFICATION.

- a. The contractor must define the periodicity for requalification/recertification not to exceed 5 years. Criteria for requalification/recertification requirements must be determined by position and based on the impact to the facility safety basis.
- b. If requalification/recertification requirements are not completed by the established due date, personnel must not continue performing assigned duties unless directly supervised by a qualified person, or an approved extension is in place.
- c. The contractor must provide a comprehensive recertification evaluation for certified positions and may do so for qualified positions.
- d. Periodic evaluations or proof of proficiency may be implemented in lieu of a comprehensive requalification evaluation and must not conflict with other applicable regulatory standards.
- e. Personnel must be considered for removal from duties under the following conditions until competence is reestablished:
 - (1) Requalification/recertification evaluation failure
 - (2) Performance deficiencies affecting safe operations
 - (3) Lapse in recurring required qualification/certification element(s).
- f. Reinstatement may be granted after remedial actions and satisfactory reevaluation(s) are completed and documented.

20. REMEDIATION.

- a. Remediation processes must be established to ensure any identified performance or knowledge gaps are corrected in a timely manner.

21. ABSENCES.

- a. The contractor must establish and implement an absence-from-duty program that considers time away and the effect on safety basis performance by position.
- b. Criteria and thresholds for reevaluation must be established and documented after extended absence.

22. EXTENSIONS.

- a. The contractor may grant extensions to requalification/recertification on a case-by-case basis by individual or by job position based on circumstances.
- b. Extensions must document justification and a total duration not to exceed 1 year.
- c. Extensions must not conflict with other applicable regulatory standards.

23. PROFICIENCY.

- a. Proficiency requirements must be established and documented for certified positions and may be established for qualified positions.
- b. If proficiency lapses, qualification/certification status must be suspended and may be reinstated after satisfactory remedial actions are performed.
- c. Reinstatement documentation should include, as applicable:
 - (1) Continuing training topics missed.
 - (2) Required reading.
 - (3) Applicable procedure updates/revisions.
 - (4) Changes in systems/processes.
 - (5) Supervised duty performance for a prescribed period.
 - (6) Examinations/evaluations.
- d. If operations are too infrequent to meet proficiency requirements, the contractor must reinstate qualification/certification prior to operation using one or more defined methods (e.g., written/oral exam, operational evaluation, walkthrough, simulated operations).

24. TRAINING DOCUMENTS AND RECORDS.

- a. Contractor must have a training document and records process and program appropriate to the technical complexity, risks, and hazards of the facility as documented in the facility safety basis. Records must comply with applicable federal records and privacy requirements.

- b. Contractors must maintain auditable documents and records, as applicable to the position and required training program elements.
 - (1) Personnel selection.
 - (2) Qualification/certification.
 - (3) Examinations and evaluations.
 - (4) Continuing training.
 - (5) Exceptions and extensions.

**ATTACHMENT 1, CHAPTER II
SPECIFIC TRAINING REQUIREMENTS, HAZARD CATEGORY 1, 2, AND 3
NONREACTOR AND REACTOR NUCLEAR FACILITIES**

1. OPERATORS AND OPERATIONS SUPERVISOR.
 - a. Operator training must include fundamentals derived from position analysis as applicable to assigned duties.
 - b. Operator training must include classroom and/or on-the-job training (OTJ) on the following topics, covering, as applicable to the position:
 - (1) Facility systems (normal/abnormal/emergency), including instrumentation, interlocks, failure modes, interfaces, and automatic/manual features.
 - (2) Principles of operation and technical terminology relevant to facility processes.
 - (3) Normal, abnormal, and emergency procedures.
 - (4) Emergency systems (components, functions, limitations).
 - (5) Criticality safety principles, controls, and specifications (as applicable).
 - (6) Radiation control practices.
 - (7) Safety basis fundamentals.
 - (8) Conduct of operations.
 - c. Operations supervisor programs should address the same content categories as operators and provide greater depth as appropriate to supervisory responsibilities.
 - d. Initial qualification for operators and operations supervisors must include a comprehensive evaluation.
 - e. For positions requiring certification, initial certification must require completion of qualification and a formal oral examination.
 - f. The contractor must establish requalification/recertification periodicity for operators and operations supervisors not to exceed 5 years.
2. TECHNICIANS AND MAINTENANCE PERSONNEL.
 - a. Technicians and maintenance personnel must be qualified to perform the task or tasks associated with their specialty or work under the direct supervision of personnel qualified to perform the activity or task.

- b. Technicians and maintenance personnel whose work involves engineered safety features must be trained and evaluated on the importance of safety significant and safety class structures, systems, and components.

2. MANAGERS.

- a. Managers may be considered qualified based on meeting personnel selection criteria and assignment to the management role.
- b. Managers with nuclear facility safety responsibilities must complete facility-specific training, commensurate with assigned responsibilities.

3. TECHNICAL SUPPORT PERSONNEL.

- a. Technical personnel assigned to perform support in a nuclear facility must possess education/experience consistent with job expectations and appropriate to hazards and risks documented in the facility safety basis.
- b. Technical personnel must complete safety basis training and any evaluations commensurate to the position.

4. HAZARD CATEGORY 1/CATEGORY A REACTOR. This section provides additional position-specific training requirements for Hazard Category 1/Category A reactor personnel.

- a. Engineering Expertise On-Shift Requirements. Safe operation demands the operating shift possess adequate operational and accident management expertise. This demand may be satisfied by designating a Shift Technical Advisor (STA) for each shift, or by combining the STA position with the shift supervisor or an on-shift Senior Reactor Operator (SRO). If the combined approach is utilized, the designated STA must consider the following qualifications:

- (1) Currently certified as an SRO.
- (2) Successful completion of STA training requirements in paragraph 3.c.
- (3) One of the following educational requirements:
 - (a) Baccalaureate in engineering.
 - (b) Professional Engineer's license,
 - (c) Baccalaureate in engineering technology, with course work in the physical, mathematical, or engineering sciences.
 - (d) Baccalaureate in a physical, mathematical, or engineering science, with course work in engineering technology.

- b. Simulator Requirements. The need for a full-scope or part-task simulator for DOE test and research reactors may be based on an evaluation conducted by the operating organization.

- c. Shift Technical Advisor. Contractor must determine STA training. STA training must include:
 - (1) Postulated accidents analyzed in the facility DSA and the potential consequences of these accidents.
 - (2) Response to an analysis of facility transients and accidents.
- d. Reactor Operators (ROs). Contractor must develop an RO training program that includes an operational evaluation. RO training must include:
 - (1) Procedures and TSRs including normal, abnormal, emergency, and administrative procedures; and operational limitations.
 - (2) Use of installed facility systems for the control and mitigation of an accident in which the core may be severely damaged.
- e. Senior Reactor Operators. Contractor must develop an SRO training program that includes an operational evaluation. SRO training must include:
 - (1) Operating limitations in the TSRs and their bases.
 - (2) Assessment of facility conditions and selection of appropriate procedures during normal, abnormal, and emergency situations.
 - (3) Conditions and limitations for facility operations.
- f. Operating Crew/Shift Training.
 - (1) Reactor operator candidates must: (i) be assigned to an operating crew full-time for a minimum of 3 months' shift training, with no concurrent duties unrelated to facility operations, and (ii) during this period, under the observation and control of a certified reactor operator, manipulate the facility controls and perform the same duties as a certified reactor operator.
 - (2) SRO candidates must: (i) be assigned to an operating crew full-time for a minimum of 3 months' shift training with no concurrent duties unrelated to facility operations, and (ii) during this period, under the observation and control of a certified SRO, supervise the manipulation of the facility controls and perform the same duties as a certified SRO.
- g. Control Manipulation Requirements for Certified Positions.
 - (1) The list of control manipulations for certified positions is based on a SAT analysis for these positions. This list (i) specifies which manipulations are to be performed annually and which are to be performed periodically as defined by the contractor not to exceed 5 years, and (ii) identifies any control manipulations that may affect reactivity.

5. CATEGORY B REACTOR.

- a. Fuel Handling Operations. All fuel handling operations must be performed by or under the direct supervision of a person certified to perform such operations. Supporting requirements: (1) establish a specific training and qualification program (initial and continued) to certify fuel handling operators and supervisors for their assigned tasks, and (2) administer written evaluations. Training and evaluations may be limited to that needed for fuel handling safety, the impact of fuel handling on safety, and actions to be taken during abnormal and emergency conditions.

The requirements above do not apply if fuel handling is performed by reactor operators and SROs trained for fuel handling.

- b. Reactor Operators. Training for ROs may consider the previous experience, training, and level of responsibility of the candidate. The qualification program may include both classroom-type and on-the-job training to assure familiarity with all required aspects of reactor operation, including anticipated transients and accident conditions. Where construction precludes OTJ training, practical experience at similar reactors, training on simulators, and other appropriate training may be accepted. Training must include information from the following as applicable:

- (1) Facility design and operating characteristics, including facility design features, design and operating characteristics and limitations, safety and emergency systems, experiment and test facilities, engineered safety features, and shielding.
- (2) An understanding of the DSA, TSRs, system description manuals, and operating procedures.
- (3) Principles of facility operation, including principles of reactor operation, radiological protection, effects of experiments, basic reactor theory, heat transfer, fluid flow, and thermodynamics, as necessary, for the specific design of the reactor.
- (4) Instrumentation and control, including nuclear instruments, process instruments, control systems, radiation monitoring systems and survey equipment, experiment and test facility instrumentation, and manipulation of reactivity controls.
- (5) Procedures and TSRs, including normal, abnormal, emergency, radiological and hazardous materials control and administrative procedures, and operational limitations.
- (6) Written evaluations based on the above learning objectives and developed from an analysis of the job must be administered to reactor operator candidates.

- c. Senior Reactor Operators. Training for SROs may consider the previous experience, training, and level of responsibility of the candidate. Training must include information from the following as applicable: radioactive materials handling, including special nuclear material and radioactive materials hazards, handling, disposal, and safe practices.
 - (1) Information in the DSA, TSRs, system description manuals, and operating procedures, and lessons learned from occurrence reports.
 - (2) Advanced theory and operation, including reactivity effects during experimental and maintenance activities, fuel handling, fuel burnup and reactivity worth; alterations in core configuration; TSRs and their technical bases; and administrative responsibilities for an SRO's level of responsibility.
 - (3) Written evaluations based on the above learning objectives developed from an analysis of the job must be administered to SRO candidates.
- d. Control Manipulation Requirements for Certified Positions. (See Chapter III, Section 3.)
- e. Medical Examination Requirements. For Hazard Category 2/Category B reactors, the contractor must comply with 10 CFR § 851, Worker Safety and Health Program, Appendix A, Section 8, Occupational Medicine. Medical personnel are encouraged to use the medical examination criteria and procedures in ANSI/ANS 15.4-2016, Selection and Training of Personnel for Research Reactors.

6. REACTOR FACILITY PROFICIENCY.

General proficiency requirements are provided in Chapter 1, Section 24. The following are the minimum duty times to maintain proficiency for ROs and SROs:

- a. Hazard Category 1/Category A Reactors: as determined by the contractor no less than 12 hours per quarter, in blocks of time no less than four hours.
- b. Category B Reactors: to maintain active status, perform certification duties for at least four hours per quarter.
- c. If proficiency is not maintained, the person may not be assigned duties. Prior to restoring an employee to duty following loss of active status, the contractor may evaluate and document the following factors:
 - (1) Continuing training topics missed (if any).
 - (2) Required reading applicable to the position.
 - (3) Changes in facility systems/processes.

- (4) Performance of duties under the direct supervision of a person qualified in that position for a prescribed period in accordance with section d below.
 - (5) Written and oral evaluations and performance evaluations as deemed necessary.
- d. If proficiency is not maintained, Certified ROs and SROs must:
 - (1) Perform certification duties under the direct supervision of a person certified in that position for a minimum period of time, as stated below;
 - (2) Tour the facility; and
 - (3) Review shift turnover procedures.
 - (4) The minimum required performance times for certified duties are:
 - (a) Hazard Category 1/Category A reactor-certified ROs and SROs: 12 hours (in blocks of no less than four hours).
 - (b) Category B reactor-certified ROs and SROs: six hours.

ATTACHMENT 2 REFERENCES

This Attachment provides information associated with DOE O 426.2A as well as information applicable to contracts in which the associated CRD (Attachment 1 to DOE O 426.2A) is inserted.

1. Codes of Federal Regulations.
 - a. 10 CFR § 55, *Operators' Licenses*
 - b. 10 CFR § 70, *Domestic Licensing of Special Nuclear Material*
 - c. 10 CFR § 830, *Nuclear Safety Management*
 - d. 10 CFR § 835, *Occupational Radiation Protection*
 - e. 10 CFR § 850, *Chronic Beryllium Disease Prevention Program*
 - f. 10 CFR § 851, *Worker Safety and Health Program*
 - g. 10 CFR § 1008, *Records Maintained on Individuals (Privacy Act)*
2. Nuclear Information and Records Management Association.
 - a. Nuclear Information and Records Management Association, TG15 (1998), "Management of Electronic Records"
 - b. Nuclear Information and Records Management Association, TG21-2001, "Required Records Protection, Disaster Recovery and Business Continuation"
3. Nuclear Regulatory Commission.
 - a. Regulatory Guide 1.134, "Medical Assessment of Licensed Operators or Applicants for Operator Licenses at Nuclear Power Plants"
 - b. Regulatory Guide 1.149, "Nuclear Power Plant Simulation Facilities for Use in Operator Training, License Examinations, and Applicant Experience Requirements," Rev. 4 (2011)
 - c. Regulatory Guide 1.8, "Qualification and Training of Personnel for Nuclear Power Plants," Rev. 3 (2000)
4. American National Standards Institute (ANSI)/American Nuclear Society (ANS) Standard (STD).
 - a. ANSI/ANS 3.1-2014, "Selection, Qualification, and Training of Personnel for Nuclear Power Plants"

- b. ANSI/ANS 3.4-2013, “Medical Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Power Plants”
 - c. ANSI/ANS 3.5-2009, “Nuclear Power Plant Simulators for Operator Training and Examination”
 - d. ANSI/ANS 8.1-2014, “Nuclear Criticality Safety in Operations with Fissionable Materials Outside Reactors”
 - e. ANSI/ANS 8.15-2014, “Nuclear Criticality Control of Special Actinide Nuclides”
 - f. ANSI/ANS 8.20-1991, “Nuclear Criticality Safety Training” (Reaffirmed 2015)
 - g. ANSI/ANS 15.4-2016, “Selection and Training of Personnel for Research Reactors”
5. DOE Orders (O) and Manuals (M).
- a. DOE O 151.1, *Comprehensive Emergency Management System*, current version
 - b. DOE O 206.1, *Department of Energy Privacy Program*, current version
 - c. DOE O 243.1, *Records Management Program*, current version
 - d. DOE O 251.1, *Departmental Directives Program*, current version
 - e. DOE O 414.1, *Quality Assurance*, current version
 - f. DOE O 420.1, *Facility Safety*, current version
 - g. DOE O 425.1, *Verification of Readiness to Startup or Restart Nuclear Facilities*, current version
 - h. DOE O 440.1, *Worker Protection Program for DOE (including the National Nuclear Security Administration) Federal Employees*, current version
 - i. DOE O 460.1, *Hazardous Material Packaging and Transportation Safety*, current version
6. DOE Handbooks (HDBK) and Technical Standards (STD).
- a. DOE-STD-1070-94, *Criteria for Evaluation of Nuclear Facility Training Programs* (Reaffirmed 2014)
 - b. DOE-HDBK-1078-94, *Training Program Handbook: A Systematic Approach to Training* (R: 2014)
 - c. DOE-HDBK-1211-2014, *Activity-Level Work Planning and Control Implementation*
 - d. DOE-STD-1098-2017, *Radiological Control*

- e. DOE-HDBK-1204-97, *Guide to Good Practices for the Development of Test Items*
 - f. DOE-HDBK-1205-97, *Guide to Good Practices for Design, Development, and Implementation of Examinations*
 - g. DOE-HDBK-1206-98, *Guide to Good Practices for On-The-Job Training*
 - h. DOE-HDBK-1078-94, *Training Program Handbook: A Systematic Approach to Training*
7. Other.
- a. “Department of Energy Implementation Plan for Defense Nuclear Facilities Safety Board Recommendation 2011-1,” December 27, 2011
 - b. Other training resources are available at the National Training Center Training Library (<https://sites.ntc.doe.gov/partners/tr/SitePages/Home.aspx>) and in DOE’s Technical Standards archives.

ATTACHMENT 3 DEFINITIONS

This Attachment provides information associated with Department of Energy (DOE) Order (O) 426.2B as well as information applicable to contracts in which the associated Contractor Requirements Document (CRD; Attachment 1 to DOE O 426.2B) is inserted.

1. Category A Reactor Facilities. Those production, test, and research reactors designated by DOE based on power level, potential fission product inventory, and experimental capability. Category A reactors are Hazard Category 1 nuclear facilities.
2. Category B Reactor Facilities. Those test and research reactors designated by DOE based on power level, potential fission product inventory, and experimental capability. Category B reactors are Hazard Category 2 nuclear facilities.
3. Certification. The process by which contractor management endorses and documents, in writing, the satisfactory achievement of qualification by a person for a position designated for certification. Certification follows the completion of the qualification program for those positions identified as requiring certification. The notable differences between initial certification and qualification are: (a) requirements for an oral evaluation or board, and (b) certification requires official contractor management endorsement, outside of the individual's direct supervisor, of their qualification to ensure senior management involvement in the qualification of designated operations positions (i.e., operators and supervisors).
4. Certified Personnel. Persons who have current certification in accordance with this Order.
5. Classroom Training. May include lectures, seminars, table-top exercises, computer-based training, or structured self-study activities.
6. Controls. When used with respect to nuclear reactors, apparatus and mechanisms that, when manipulated, directly affect the reactivity or power level of a reactor or the status of an engineered safety feature.
7. Direct Supervision. Continuous, in-person oversight by a qualified individual whose immediate responsibility is the supervision of personnel and who is positioned and authorized to intervene to prevent unsafe or irreversible actions. The supervising individual must be capable of promptly taking control of the activity to ensure protection of the facility, workers, the public, and the environment.
8. Documented Safety Analysis (DSA). A documented analysis of the extent to which a nuclear facility can be operated safely with respect to workers, the public, and the environment, including a description of the conditions, safe boundaries, and hazard controls that provide the basis for ensuring safety. (10 CFR § 830, Nuclear Safety Management).
9. Education. The successful completion of the requirements established by an accredited educational institution.

10. Engineered Safety Features. Structures, systems, or components that prevent and/or mitigate the consequences of potential accidents described in the DSA.
11. Evaluation. The process of assessing the effectiveness of an individual's performance based on established learning objectives defined for the knowledge, skills and abilities of the position. Types of evaluation may include performance demonstration, examination, operational evaluation, oral exam, oral board, walkthrough or any combination thereof.
12. Exception. As used in this Order, a release of an individual from portions of a training and qualification program through prior education, experience, testing, evaluation of work products, and training.
13. Exemption. A formal and final release from a provision in a DOE Order, Notice, or Manual included in the contract; or from one or more requirements in a Regulation. (See DOE O 410.1, *Central Technical Authority Responsibilities Regarding Nuclear Safety Requirements*, current version.)
14. Fissionable Materials. A nuclide capable of sustaining a neutron-induced fission chain reaction. Nuclides such as uranium-233, uranium-235, plutonium-238, plutonium-239, plutonium-241, neptunium-237, americium-241, and curium-244.
15. Fissionable Materials Handler. A person certified by contractor facility management to manipulate or handle significant quantities of fissionable materials or manipulate the controls of equipment used to produce, process, transfer, store, or package significant quantities of such materials.
16. Full-Scope Simulator. A simulator incorporating detailed modeling of systems of the reference facility with which the operator interfaces in the control room environment. The control area operating consoles are included. Such a simulator demonstrates expected facility response to normal and abnormal conditions.
17. Graded Approach. The process to ensure a risk-informed approach considering the level of analysis, documentation, and actions used to comply with a requirement are commensurate with: (a) the relative importance to safety, safeguards, and security; (b) the magnitude of any hazard involved; (c) the life-cycle stage of a facility; (d) the programmatic mission of the facility; (e) the particular characteristics of a facility; (f) the relative importance of radiological and nonradiological hazards; and (g) any other relevant factors (10 CFR § 830). Proper use of a systematic approach to training (SAT) ensures the application of the graded approach.
18. Hazard Category. The calculated consequences of postulated unmitigated releases of radioactive and/or hazardous material evaluated as required by 10 CFR § 830 and classified by the following hazard categories:
 - a. Category 1: The hazard analysis shows the potential for significant offsite consequences.
 - b. Category 2: The hazard analysis shows the potential for significant onsite consequences.

- c. Category 3: The hazard analysis shows the potential for only significant localized consequences.
19. Job Analysis. A systematic method used in obtaining a detailed listing of the tasks of a specific job.
 20. Maintenance Personnel. Persons responsible for performing maintenance on engineered safety features and support systems as identified in the DSA (this would include personnel responsible for planning and preparing the work packages associated with maintenance).
 21. Manager. A person whose assigned responsibilities include one or more of the following: nuclear safety, operational efficiency and reliability, control of reactor or nonreactor nuclear facility emergencies, and any other activities necessary to safeguard the reactor and nonreactor facilities.
 22. Medical Examination. An examination performed by a licensed physician or performed by physician's assistant that is subsequently reviewed and approved by a licensed physician, to determine the physical condition and general health of a person for duty.
 23. Must and May. (a) Must is used to denote a requirement; (b) may is used to denote permission or recommendation.
 24. Nonreactor Nuclear Facility. Those facilities, activities, or operations that involve or will involve radioactive and/or fissionable materials in such form and quantity that a nuclear or a nuclear explosive hazard potentially exists to workers, the public, or the environment, but does not include accelerators and their operations and does not include activities involving only incidental use and generation of radioactive materials or radiation, such as check and calibration sources; use of radioactive sources in research, experimental, and analytical laboratory activities; electron microscopes; and X-ray machines (10 CFR § 830).
 25. Nuclear Experience. When used in reference to Hazard Category 1/Category A and Category B Reactors, experience acquired at commercial, production, training, test, military, or research reactors, including experience acquired in reactor facility startup activities or operation. Experience in design, construction, maintenance, or related technical services that are job-related may also be considered. Appropriate research, teaching, or both may be counted as nuclear experience. When used in reference to nonreactor nuclear facilities, also includes experience acquired at any facility in which radioactive materials are routinely handled, stored, processed, or utilized. Nuclear power plant experience is experience acquired in the testing, operation, or maintenance of nuclear or other power-generating facilities. Experience in design and construction may be considered applicable power plant experience and may be evaluated on a case-by-case basis.
 26. Nuclear Facility. A reactor or nonreactor facility, classified as Hazard Category 1, 2, or 3, where an activity is conducted for or on behalf of DOE and includes any related area, structure, facility, or activity to the extent necessary to ensure proper implementation of the requirements established in 10 CFR § 830.

27. Operators. Persons responsible for performing operations associated with engineered safety features as identified in the DSA, operating support systems which could affect engineered safety features, or conducting activities with special nuclear material. Duties may include manipulating facility controls, monitoring parameters, and operating facility equipment. Operators include reactor operators, fissionable material handlers, tritium facility operators, chemical process operators, waste tank operators, and enrichment facility operators.
28. Operating Organization. The contractor organization responsible for facility operation, maintenance, and technical support services related to DOE nuclear facility operations.
29. Operational Drill. A drill conducted in the facility that exercises process/facility equipment, procedures, and level of knowledge for qualified/certified positions. These activities are also intended to demonstrate knowledge of operational procedures during abnormal conditions.
30. Operational Evaluation. A documented evaluation of an individual's knowledge and skills for a position requiring qualification/certification. The operational evaluation is a facility walkthrough evaluation conducted for qualification/certification that may include system and/or component operation or simulation of operations, during which the candidate is observed and questioned regarding procedures, safety implications, system knowledge, and operational safety requirements, as applicable.
31. Participation. Taking an active role in the duties and responsibilities relative to the function for which the candidate/trainee is being considered. Simple observation is not considered participation.
32. Performance Demonstration. A documented evaluation of an individual's knowledge and skills for a position requiring only qualification. The intent of the process is similar to that of an operational evaluation, but tailored to more limited job requirements. (See definition of operational evaluation.)
33. Performance Evaluation. A generic term used to describe when one's performance is being evaluated to determine whether the evaluated person possesses the knowledge and skills required to perform identified jobs, tasks, or processes.
34. Practical Factors. Discrete tasks identified in the design phase and performed using approved procedures, administrative guides, and common practices while under the instruction of a qualified operator, supervisor, or manager. May also be accomplished performing the duties of the qualified position.
35. Proficiency. Active participation in job functions associated with the position (whether qualified and/or certified) for a specified amount of hours per month or quarter, as specified in facility procedures.
36. Provisional Qualification. Temporary authorization for individuals who have met initial criteria but require further evaluation before achieving full qualification. This status permits operation under defined conditions while additional tests, assessments, or training are completed. It may also allow operation equivalent to full qualification when appropriate compensatory measures are in place.

37. Qualification. The process for attaining, demonstrating, and documenting the knowledge, skills, and abilities identified for a position by the SAT process. It includes education, experience, classroom and on-the-job training, evaluation, and any special requirements necessary to perform assigned responsibilities for a given position.
38. Reactor. A device used to initiate and control a sustained nuclear chain reaction.
39. Reactor Operator. A person certified by contractor nuclear facility line or program management to operate (manipulate the controls of) a DOE-owned reactor.
40. Remediation. Training designed to correct a deficiency when training results in a less than adequate or failed outcome, satisfy completion of a reexamination, and/or provide proof of completion for a missing training requirement.
41. Safety Analysis. A documented process: (a) to provide systematic identification of hazards within a given DOE operation; (b) to describe and analyze the adequacy of measures taken to eliminate, control, or mitigate identified hazards; and (c) to analyze and evaluate potential accidents and their associated risks.
42. Safety Basis. The DSA and hazard controls that provide reasonable assurance the DOE nuclear facility can be operated safely in a manner that adequately protects workers, the public, and the environment (10 CFR 830).
43. Senior Reactor Operator. A person certified by contractor nuclear facility line or program management to operate and direct the operation of a DOE-owned reactor.
44. Shift Supervisor. A person qualified or certified by the operating organization and designated by contractor facility management to directly supervise operations, operational activities, and operations-related activities of personnel at DOE-owned reactor and nonreactor nuclear facilities. Substitute titles may be used for positions of equivalent functions.
45. Shift Technical Advisor. A person who has been assigned to provide on-shift advice and counsel to shift operating personnel during shift activities and to help determine cause and mitigation of facility accidents.
46. Significant Quantity of Fissionable Materials. The minimum quantity of fissionable material in designated form for which control is required to maintain subcriticality under all normal and credible abnormal conditions. The single parameter limits for fissionable materials are listed in ANSI/ANS-8.1-2014, Nuclear Criticality Safety in Operations with Fissionable Materials Outside Reactors, and ANSI/ANS-8.15-2014, Nuclear Criticality Control of Special Actinide Elements. These standards require that limits be adjusted where process conditions could credibly involve moderators or reflectors that are more effective than light water.

47. Supervisors. Individuals who are responsible for the quantity and quality of work performed and who direct the actions of operators, fissionable material handlers, technicians, or maintenance personnel. Supervisory positions typically include shift operations manager (or shift manager), reactor supervisors, fissionable material handler supervisors, tritium operator supervisors, chemical process operator supervisors, waste tank operator supervisors, maintenance supervisors, technician supervisors, and technical support supervisors. Their duties include ensuring work is performed in compliance with procedures, policies, and industrial safety practices.
48. Systematic Approach to Training. Any logical process for identifying and acquiring the knowledge, skills, and abilities required to safely perform the duties of a specific position. It includes the following elements:
 - a. An analysis of the jobs to be performed
 - b. Design of learning objectives derived from the analysis of the job that describe desired performance after training
 - c. Development of lesson plans and other training materials
 - d. Implementation of the developed training
 - e. Evaluation of trainee mastery of the objectives during training
 - f. Evaluation and revision of the training based on the performance of trained personnel in the job setting.
49. Task. A well-defined unit of work having an identifiable beginning and end, which is a measurable component of the duties and responsibilities of a specific job.
50. Technical Personnel. Persons responsible for supervision, design, evaluation, modification, testing, and performance of technical support functions for the operating organization. Technical personnel typically have expertise in mechanical, electrical, instrumentation and control, chemistry, radiation protection, safety, quality assurance/independent assessment, software quality assurance, facility engineering, system/process engineering, safety basis engineering, criticality safety, or nuclear safety. (Examples of technical personnel responsibilities include: surveillance and testing related to normal facility operation and operation of safety-related systems; analyzing routine operational/facility data; planning modifications to facility safety systems; providing technical assistance during normal, abnormal, and emergency facility conditions to offer technical problem resolution to operations in their area of expertise; providing engineering/technical assistance in support functions to the facility such as radiological, quality assurance, and for initial design or modifications that impact nuclear safety.)
51. Technical Safety Requirements. The limits, controls, and related actions that establish the specific parameters and requisite actions for the safe operation of a nuclear facility and include, as appropriate for the work and hazards identified in the DSA for the facility: safety limits, operating limits, surveillance requirements, administrative and management controls, use and application provisions, and design features, as well as a bases appendix (10 CFR 830).

52. Technicians. Persons principally involved in calibration, inspection, troubleshooting, testing, maintenance, and radiation protection activities. Examples are laboratory technicians, instrument technicians, industrial hygiene, environmental, quality control, decontamination and decommissioning technicians, and radiological control technicians.
53. Training. Instruction designed for acquisition of knowledge, skills, and abilities to develop or improve job performance.
54. Training Implementation Document. A document prepared by the contractor to identify those sections of this CRD that are applicable to a particular facility. The document defines and describes the application of personnel selection, qualification, certification, and training requirements identified in this CRD. It must clearly define the organization, planning, and administration of the program and set forth the responsibility, authority, and methods for conducting training. Suitable justification must be included in the document for CRD provisions that are not implemented. At sites with several facilities, a combined training document may be submitted.
55. Training Organization. The entity responsible for supporting the line organization to identify, meet, and monitor training needs in support of the facility mission. The training organization assists line organizations in performing the SAT. The training organization may include a training manager, instructional technologists, and instructors.
56. Training and Qualification Program. A planned, organized sequence of activities designed to prepare individuals to perform their jobs, to meet a specific position or classification need, and to maintain or improve their performance on the job.
57. Unescorted Facility Access Training. The training required to allow persons to have unescorted access to reactor and nonreactor nuclear facilities. UFAT supersedes general employee training.